

THUNDERSTORM-BREEDING SPOTS.

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By ROBERT E. HORTON.

[Voorheesville, N. Y., October, 1920.]

It appears probable that under even favorable conditions as regards the cyclonic circulation, thunderstorms only develop from convective puffs of ascending air, when the violence of the ascending current exceeds some minimum limit corresponding to the weather conditions overhead for the day. It may happen that local conditions in a certain place will induce convective activity of sufficient strength to produce thunderstorms day after day, whereas at a near-by locality only a few miles distant only cumulus clouds will develop. An appropriate name for these spots where thunderstorms may be bred in large numbers is wanting, and so they may merely be called "thunderstorm-breeding spots." Very likely such spots are numerous, and could be quite accurately and permanently mapped with sufficient data. General observation indicates some locations where they may occur. For example, some cities, if not indeed most inland cities of say 100,000 population or more, appear to be thunderstorm spots.

The writer has observed some thunderstorms over some cities, for example, Albany, N. Y., and Providence, R. I., which originated immediately over the city and did not travel far outside their limits on days when there were no other adjacent thunderstorms. Again a shallow lake with sandy margins located in a forest may serve as a thunderstorm breeder. The writer has observed thunderstorms originating near the westerly end of Oneida Lake, traveling eastward about 18 miles, the length of the lake, and then dying out soon after reaching the easterly shore, on days when there were no thunderstorms in the surrounding country. Oneida Lake is about 5 miles wide and 18 miles long, located in a flat and generally wooded region and has warm, shallow waters and sandy shores. The water and sand of the lake become much warmer than the surrounding air, especially warmer than that in the woods on summer afternoons.

Capt. Harry Barker describes a number of occurrences of thunderstorms in the Grand Canyon of the Colorado. The air in the bottom of the Canyon became intensely overheated, and apparently rose to condensation level, which was below the rim, so that the thunderstorm with vivid playing of the lighting could be observed from the top of the Canyon rim, looking over the clouds to the opposite margin of the Canyon, which was clear.

Some western arroyos are notable for the frequency of occurrence of so-called cloudburst thunderstorms. Statistics are not available, but general reports seem to indicate that such storms occur more often on some arroyos than on others adjacent to them. The conditions of occurrence of thunderstorms in the Grand Canyon, and the conditions favoring thunderstorm-breeding spots, suggest that possibly some arroyos, or their drainage areas may be so situated as to form very favorable breeding spots for thunderstorms.

The facility of this operation may be affected by orientation and isolation, so that one arroyo basin might be a frequent starting point for thunderstorms, whereas another adjacent to it might rarely produce them. While this point is as yet purely hypothetical, it is worthy of further study, since a tendency to the frequent occurrence of thunderstorms in certain arroyo basins or on their headwater plateaus more often than on those adjacent, might be a very important factor affecting the

design of dams such as are commonly located in these canyons for irrigation and other purposes.

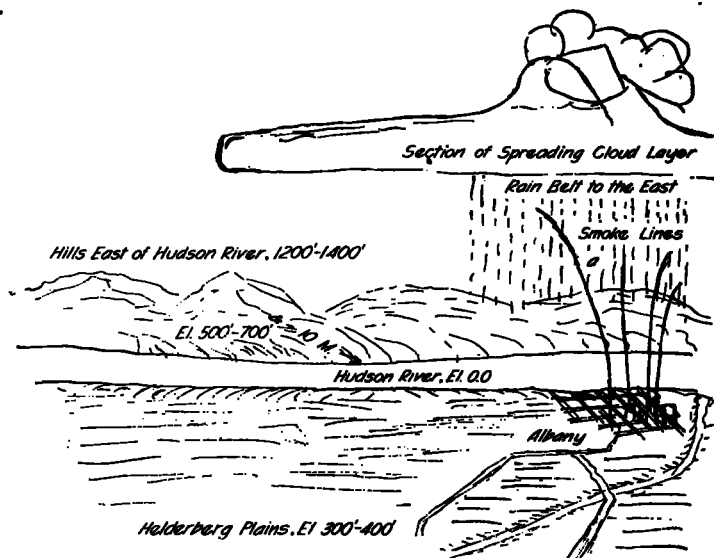
If it is true, as the writer believes, that certain places are exceedingly favorable to the generation of thunderstorms, then it appears to be a matter worthy of careful study. An indication of the truth of the supposition that cities breed thunderstorms might be obtained by comparison of rain gages in the surrounding country with records taken in the city during the thunderstorm months. Records of the number of thunderstorms taken in large cities are probably not sufficiently accurate to afford a reliable basis of comparison with thunderstorm frequency in the immediate surrounding country. Should it prove true that cities are in some instances thunderstorm breeders, whereas other near-by cities may not possess this characteristic, then such facts might have a very important bearing on various engineering problems, notably storm-sewer design, and might vitiate the utility of application of records of thunderstorm rain intensities in one city to another near-by city, even though the climate of the two places and the total rainfall per annum might be very nearly the same.

THE BEGINNING OF A THUNDERSTORM.

By ROBERT E. HORTON.

[Voorheesville, N. Y., August, 1920.]

It is not often that one can watch the inception of a local thunderstorm. Such an opportunity occurred to the writer on the afternoon of July 26, 1920. The



morning weather map showed an enormous high, prevailing generally over central New York, with isobar 30.1 at Albany. The writer was in the city of Albany during the afternoon. The sky was generally clear between 2 and 5 p. m., with occasional flat-bottom fair-weather clouds. Coming out of a building at 5 p. m., and starting westward by automobile, I noticed a layer of dark clouds directly overhead and heard thunder nearby to the east.